TIMING SYNCHRONIZATION USING DIRTY TEMPLATES IN ULTRA WIDEBAND (UWB) COMMUNICATIONS

ABSTRACT

Techniques are described for synchronizing the timing of the receiver with the received waveform in ultra wideband (UWB) communication systems. Unlike conventional techniques in which a "clean" transmit-waveform is correlated with the received waveform to estimate the timing offset, the described techniques correlate the received waveform with dirty templates, i.e. segments of the received waveform, with the received waveform to estimate the timing offset. The described techniques include receiving an ultra wideband (UWB) waveform through a wireless communication channel, wherein the received UWB waveform comprises bursts of information-bearing symbols. A template is selected to be used for estimating the timing offset of a burst of the received UWB waveform, wherein the template comprises a segment of a burst of the received UWB waveform, and the template is correlated with a segment of a burst of the received waveform so as to form an estimate of the timing offset of the received UWB waveform. A stream of symbol estimates is output in accordance with the estimated timing offset.